SERVICE BREAKS

SEPTEMBER, 10 1998

MECHANICS

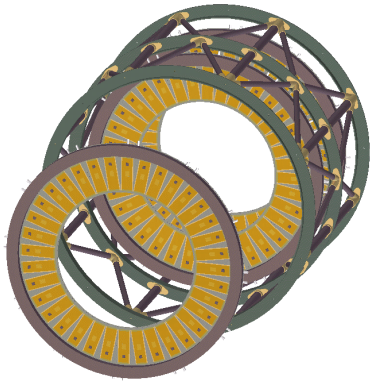
E. ANDERSSEN, LBNL/CERN

Topics

- Locations for disconnects
- Fluid connections
- Electrical Connections
- Optical Connections

Disconnection Locations

Full cabling must be attached to disk prior to insertion



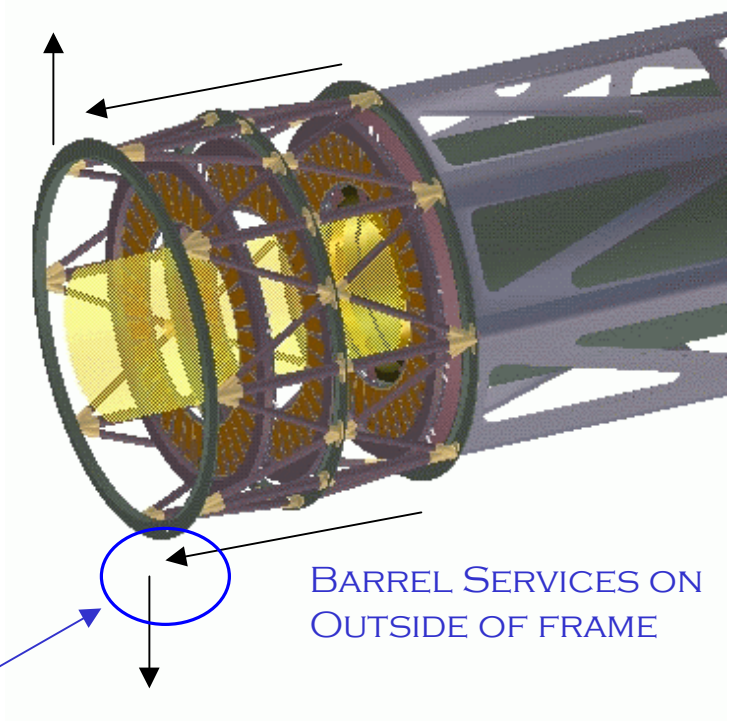
Do not want long pigtails at this stage of Assembly

Cables and Tubes do not necessarily break at same locations.

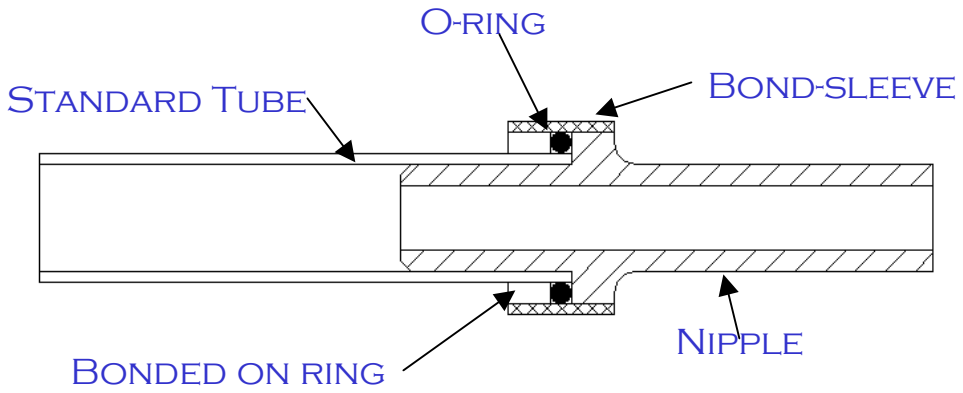
- **Assembly sequence Factors into Breaks**
  - Just outside Support Cone
  - AT Disk Radius
  - At End of overall Structure
  - At Manifolds

Connectors at Exit

- **At right angle exit from Detector, connectors are absolutely necessary for assembly of rigid tubing**
- **Cables can be coiled**
  - Careful: (!) 2km/side

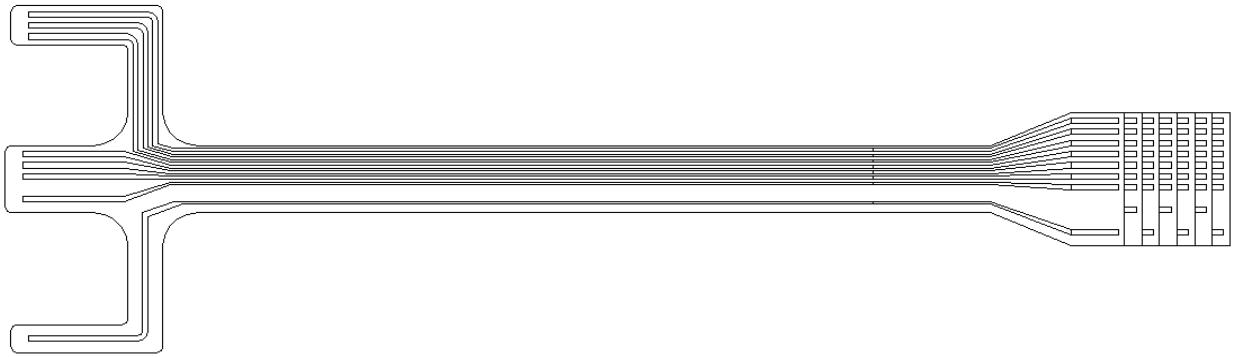


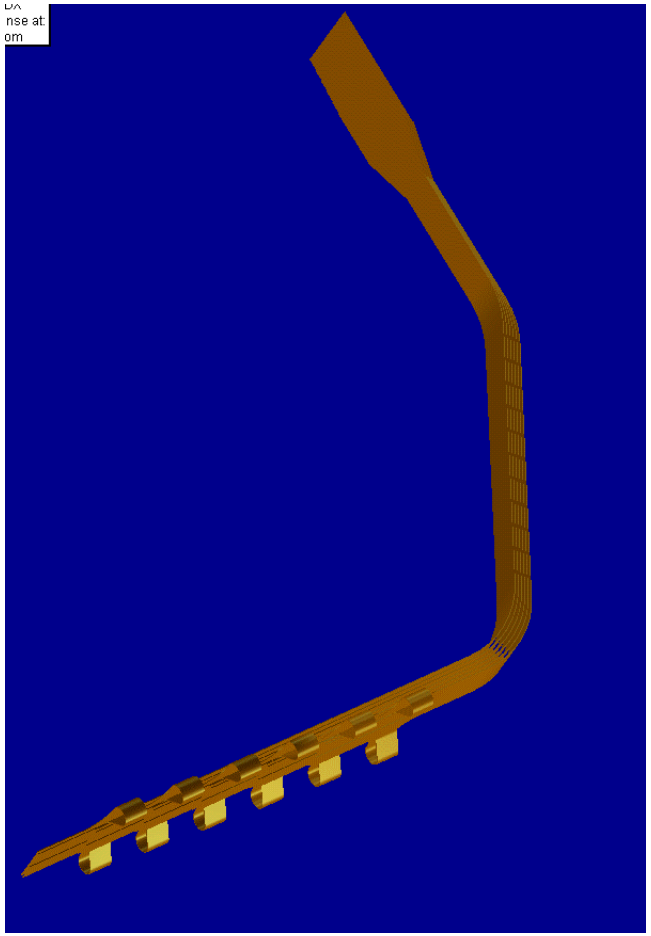
Proposed "fitting"



- **Points addressed over bonded sleeve**
  - O-ring prevents glue ingression
  - Tube length maintained
  - Mass Stays constant
  - bending stresses resolved by nipple
  - No Straight-length requirement

Termination Pigtails

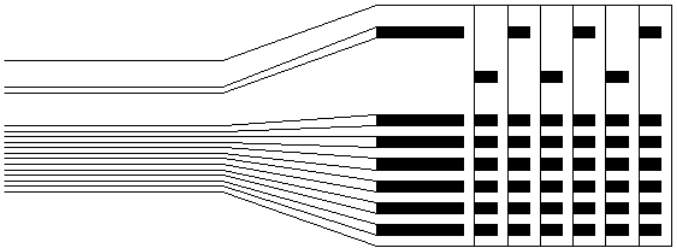


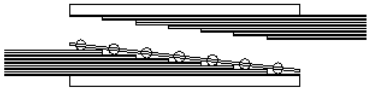


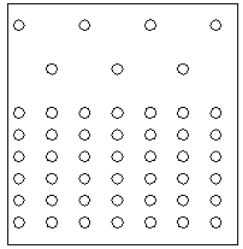
- **Need to bring 7 cables into end of Stave**
- **Need to bring Double sided to Single sided for connection/wire-bonding**

High Density Interconnect

- 7-ply Single sided Flex
- Flat reinforced
- BGA of riveted balls as contacts
- Mechanically Preloaded
- Prototype Manufactured at CERN



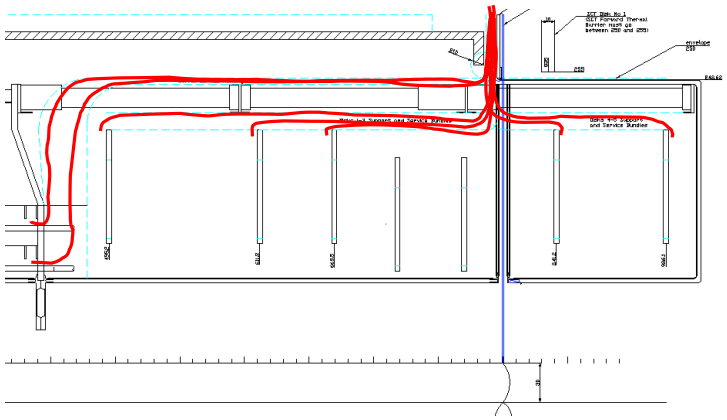




OPTICAL FIBER LENGTH - TO PPB1

INTERNAL ROUTING OF CABLES TO GLOBAL SUPPORTS

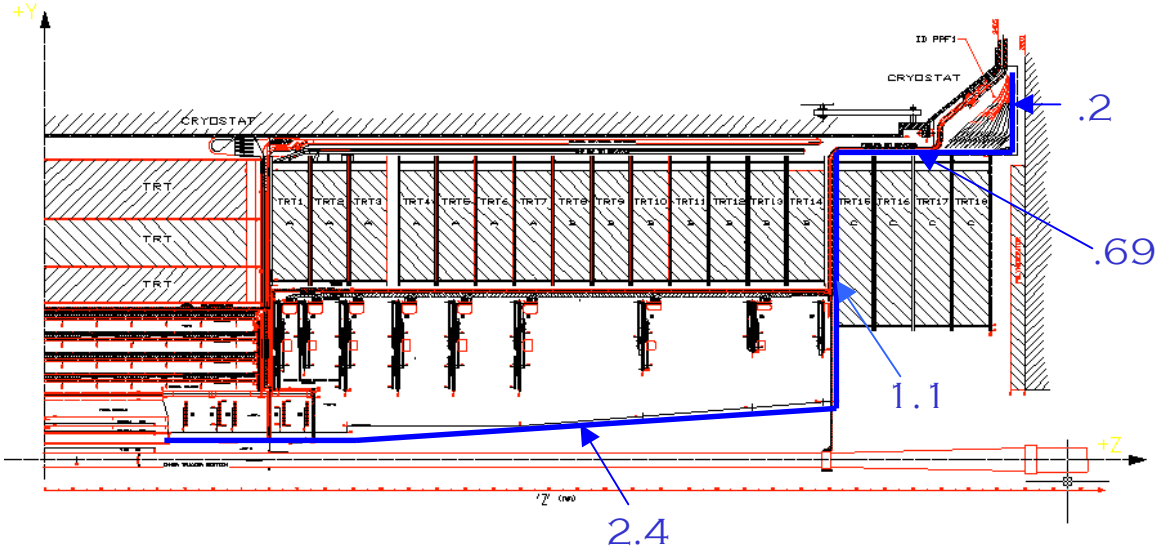
Locations of Interest	Radius	Z-position	Circumf.	Cable Length	Modules Serviced
Barrel Layer 1	10.18	44	63.96	53.32	546
Barrel Layer 2	13.23	44	83.13	50.27	728
Disk 1 +1.5z	22	51	138.23	34.5	144
Disk 2 +1.5z	22	62.7	138.23	22.8	144
Disk 3 +1.5z	22	68.5	138.23	17	144
Disk 4	22	84.1	138.23	4.6	144
Disk 5 -1.5z	22	92.6	138.23	13.1	144
			AVG LENGTH	**39.6**	1994



- **LENGTH OF ROUTING WITHIN GLOBAL SUPPORT STRUCTURE OF PIXEL DETECTOR - NEED TO ADD FOLLOWING TO ABOVE**
  - DISTANCE TO PPB1
    - [(115 - 25) + PHI ROUTING(30CM)] X (3-FIBERS) X (1994 MODULES)
  - ROUTING ALONG MODULE SUPPORT ELEMENTS
    - 5CM PER FIBER FOR EACH DISK MODULE (2 X 5 X 72) X (3-FIBERS)
    - (40CM/2) X (13 MODULES PER STAVE) X (98 STAVES) X (3-FIBERS)

MODULES TO PPB1: 10.42 KILOMETERS

Optical Fiber Length – to PPF 1



0.20	Run from End of B-Layer Stave to PPF 1
0.69	
1.10	
+2.40	
4.39m	

- **Above run of 4.39m services 234 modules on B-Layer**
- **Additional Length for run along stave must be added for 18 staves**
  - (40cm/2) X (13 modules per stave) X (18 Staves) X (3-fibers)

Modules to PPF 1: 3.22 kilometers